



Soil Sampling Protocol

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In May, 2007 the Central Valley Regional Water Quality Control Board (Regional Board) adopted Waste Discharge Requirements General Order R5-2007-0035 for Existing Milk Cow Dairies (the General Order). If you are covered under the General Order, you will need to comply with soil monitoring requirements. The General Order requires that **soil samples** be taken for each land application area identified in the Nutrient Management Plan (NMP). "Sampling must begin by summer of 2008 and then once every five years from each land application area" during coverage under the General Order¹. Due to cropping patterns and the need to sample between plantings in multiple-crop programs, samples taken in the calendar year of 2008 (spring or fall) will be acceptable for the first sampling set. Results must be submitted to the Central Valley Regional Water Quality Control Board as part of the annual reporting activities (due July 1 of the following calendar year).

Part I –Identification of Sampling and Analytical Requirements

1. Table 1 outlines the constituents and frequency of minimum sampling analysis requirements specified under the General Order. For agronomic purposes, additional analyses may be needed. A site-specific Sampling and Analysis Plan is required to be developed by July 1, 2008.
2. Contact your analytical laboratory to obtain sample bags, labels and chain of custody forms.

Table 1. Nutrient Monitoring for Soil Analysis (minimum regulatory requirements).

Beginning in the summer of 2008 (*within the calendar year of 2008 is acceptable*) **and then once every 5 years from each land application area:**

Laboratory analyses for: Total Phosphorus

The following soil tests are recommended but not required:

Spring pre-plant for each crop:

Laboratory analyses for:

0 to 1 foot depth: Nitrate-nitrogen and organic matter

1 to 2 foot depth: Nitrate-nitrogen

Fall pre-plant for each crop:

Laboratory analyses for:

0 to 1 foot depth: Electric conductivity, nitrate-nitrogen, soluble phosphorus, potassium and organic matter

1 to 2 foot depth: Nitrate-nitrogen

2 to 3 foot depth: Nitrate-nitrogen

¹ Order No. R5-2007-0035. Waste Discharge Requirements for General Order for Existing Milk Cow Dairies. May 3, 2007. Available at http://www.waterboards.ca.gov/centralvalley/adopted_orders/GeneralOrders/R5-2007-0035.pdf See Monitoring and Reporting Program Pages 7 & 8.

Part II – Sampling Considerations

1. Soil Sampling Planning: An individual with specialized training (such as a Certified Crop Adviser or trained agronomist) should be consulted to determine when, where and how soil samples will be collected and which specific soil tests are needed to meet agronomic and regulatory objectives. Regional Board-approved sampling procedures require a minimum of “1 composite sample for every 40 acres for dischargers with less than 400 acres of land application area and 1 composite sample for every 80 acres for dischargers with more than 400 acres of land application area” for compliance sampling.
2. Sampling Pattern: Work with your crop consultant/adviser to decide how to delineate sampling zones within fields. This may involve establishment of even smaller sampling areas than the 40-80-acre minimum required in the WDR. These sampling zones could consist of areas that have similar soil texture, crop yield, or manure application history and may exclude small areas of different texture, drainage, etc. Over time, the results of sampling “by zone” will provide a far more useful record of the impact of farming practices on soil fertility than a composite sample of a large heterogeneous field.
3. Recordkeeping: Develop a consistent method for labeling soil samples so that there will be no future confusion on location of sampling zones, sampling depth, etc. Incorporate soil sampling and analysis information into your regular crop production records for each field.
4. Soil Sampling Tools: Sampling supplies and equipment include a push-type soil sampling probe, a bucket style auger (for gravelly or claypan soils), permanent marker pens, plastic bags, chain of custody form, notebook, field map, dishpan or bucket for subsampling.

Part III – Sample Collection

1. Label sample bag with field identification (consistent with identification used in the Nutrient Management Plan), sampling zone, sampler’s name, the date and time of sampling, depth of sampling.
2. Using a soil probe (push tube) or bucket style auger (sometimes needed for gravelly soils) collect needed number of soil cores from each sampling zone and place together in a bucket or dishpan. Shovels should usually not be used for sample collection as they do not allow for the collection of a uniform representation of the sampled depth.
3. A composite sample consisting of 10-30 cores should be collected for each sampling zone. The number of cores included in the composite will depend on the size and variability of the sampling zone as well as the analyses needed. Generally, more cores are needed for nitrate, fewer for pH, P and K.
4. Thoroughly crumble and mix material in the bucket or dishpan.
5. Remove a 1 pint subsample and place in sample bag for submittal to the laboratory.
6. Preserve sample as needed. For nitrate analysis, either dry samples immediately (maximum 120 F) or keep refrigerated.
7. Complete a chain of custody form.
8. Deliver to laboratory as soon as possible.
9. Keep a copy of chain of custody form and records on sample collection & sample identification

Additional information

Contact your analytical laboratory for additional information on sample collection, handling, preservation, and delivery. Contact the Central Valley Regional Water Quality Control Board for any other information requests.

Information in this document was compiled by CDQAP to assist dairy producers in understanding and complying with the General Order Waste Discharge Requirements for Existing Milk Cow Dairies (Central Valley Regional Water Quality Control Board Order R5-2007-0035). Effort has been made to ensure accuracy, but these summaries are not official regulatory guidance and are not legal advice. Producers are advised that these summaries are not intended to be a substitute for producers reading the complete order and consulting their own legal counsel to ensure compliance with the waste discharge requirements. Should any information here conflict with the General Order and/or official information provided by the Regional Board, Board-provided information takes precedence.

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